REMARKS

Claims 1-35 and 37 were pending prior to this Response. By the present communication, no claims have been added or canceled, and claims 1-4, 9, 10, 19, 22, 24, and 32-35 have been amended to recite Applicants' invention with greater particularity. Support for the amended claim language may be found, among others, at page 13; at page 14, first paragraph; at page 14, third paragraph; at page 27, second and third paragraphs; and at page 31, third paragraph. Thus, upon entry of the present amendment, claims 1-35 and 37 will be pending in this application.

Election/Restriction

While Applicants maintain the traversal of the restriction requirement, the finality is acknowledged. Applicants reiterate that Groups I-X relate to a group of inventions so linked as to form a single general inventive concept. As stated by the Examiner, the groups are drawn to AMPA receptors, the special technical feature is an individual mutation. While the mutations may be considered different, Applicants have identified a single amino acid (Leucine) that is to be replaced. Applicants have further identified the exact position of the Leucine within the amino acid sequences of the invention, and have determined a correlation of the position as determined by the species from which the sequence originates.

Objections to the Claims

Applicants respectfully traverse the objection of claims 1-23, 34-35 and 37 because they allegedly contain limitations drawn to non-elected Groups of inventions. Applicants have amended claims 1-4, 9, 10, 19, 22, 24, 34 and 35 and submit that the rejected claims now recited subject matter limited to the elected Group. Withdrawal of the objection is respectfully requested.

Rejection under 35 U.S.C. § 101

Applicants respectfully traverse the rejection of claims 10-16 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Specifically, the Examiner alleges that the claims read on transfected cells in a human, and thus are not patentable subject matter. Applicants have amended claim 10 by adding the limitation "isolated" to the host. Withdrawal of the rejection is respectfully requested.

Applicants respectfully traverse the rejection of claims 34-35 under 35 U.S.C. § 101 as allegedly claiming a recitation of a use without setting forth any steps involved in the process. Applicants have amended claims 34 and 35 to recite the steps involved in the process. Withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. § 112, First Paragraph

The rejection of claims 1-17, 21-23, 34-35 and 37 under 35 U.S.C. §112, first paragraph, as allegedly not enabling a person skilled in the art to make and use the invention commensurate in scope with the claims, is respectfully traversed. Specifically, the Examiner alleges that the specification, which is enabling for a nucleic acid encoding a full length AMPA Receptor protein of SEQ ID NO:7, or a nucleic acid of SEQ ID NO:17, does not reasonably provide enablement for a complement of a nucleic acid which hybridizes to a nucleic acid encoding SEQ ID NO:7; or a nucleic acid which encodes SEQ ID NO:7 and further comprising amino acid additions substitutions or deletions; or a nucleic acid which encodes an AMPA-type receptor and further comprising amino acid additions substitutions or deletions. The Examiner further alleges that since the claims encompass nucleic acids encoding variant polypeptides and given the art recognized unpredictability of the effect of mutations on protein function, it would require undue experimentation to make and use the claimed invention.

The test of enablement is whether one skilled in the art could make or use the claimed invention from the disclosures in the patent coupled with information known in the art without

undue experimentation. *United States v. Telectronics, Inc.,* 857 F.2d 778, 8 USPQ2d 1217 (Fed. Cir. 1988); *In re Stephens,* 529 F.2d 1343, 188 USPQ 659 (CCPA 1976); MPEP §2164.01. The amount of experimentation that is permissible to provide enablement depends upon a number of factors, which include: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability of the art, and (8) the breadth of the claims. *In re Wands,* 858 F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988); MPEP §2164.01.

The fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation. *M.I.T. v. A.B. Fortia,* 774 F.2d 1104, 227 USPQ 428 (Fed. Cir. 1985). The quality of any necessary experimentation would clearly be undue when Aingenuity beyond that to be expected of one of ordinary skill in the art is required. *Fields v. Conover,* 443 F.2d 1386,1391, 170 USPQ 276, 279 (1971). "The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed." *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (*citing, In re Angstadt*, 537 F.2d 489, 502-04, 190 USPQ 214, 218 (CCPA 1976)). For example, if a very difficult and time consuming assay is needed to identify a compound within the scope of a claim, then this great quantity of experimentation should be considered in the overall analysis. Time and expense are merely factors in this consideration and are not the controlling factors. *United States v. Telectonics Inc.,* 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1046 (1989). Time and difficulty of experiments are not determinative if they are merely routine. Applicants have provided the functional limitation that the polypeptides of the invention function as non-desensitizing AMPA-receptors, or as non-desensitizing subunits thereof. Furthermore, the specification provides adequate teaching for construction of the polypeptides of the invention, and their subsequent analysis for functionality as a non-desensitizing AMPA-receptor (see Examples 1-7). Finally, Applicants have amended

the claims 1-4, 9, 10, 19, 22, 24, 34 and 35 to include the structural limitation that the amino acid sequence has at least 70% identity to SEQ ID NO: 7. Accordingly, Applicants respectfully submit that one of skill in the art, having read the specification, would be able to make and use the polypeptides of the invention as claimed.

It is noteworthy to also determine the breadth of the claims when determining whether a specification enables the claimed invention. The breadth of the claims was a factor considered in *Amgen v. Chugai Pharm. Co.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir.), *cert. denied*, 502 U.S. 856 (1991). In the *Amgen* case, the patent claims were directed to a purified DNA sequence encoding polypeptides which are analogs of erythropoietin (EPO). The court stated that:

> Amgen has not enabled preparation of DNA sequences sufficient to support its all-encompassing claims. . . . [D]espite extensive statements in the specification concerning all the analogs of the EPO gene that can be made, there is little enabling disclosure of particular analogs and how to make them. Details for preparing only a few EPO analog genes are disclosed. . . . This disclosure might well justify a generic claim encompassing these and similar analogs, but it represents inadequate support for Amgen's desire to claim all EPO gene analogs. There may be many other genetic sequences that code for EPO-type products. Amgen has told how to make and use only a few of them and is therefore not entitled to claim all of them. 927 F.2d at 1213-14, 18 USPQ2d at 1027.

The court in *Amgen* focused on the fact that the claims were directed to DNA sequences that encoded amino acid sequences, wherein the amino acid sequences had substitutions but preserved a particular physiological activity. Additionally, the specification did not give those skilled in the art guidance as to which amino acids could be changed to either preserve or enhance the activity of the protein. Thus, the amino acid sequences mentioned in the claims in *Amgen* were of differing scope.

Unlike *Amgen,* Applicants have identified the exact amino acid at the exact position of the amino acid sequence that is to be replaced while retaining a desired functionality. While a functional limitation may be considered to be an attempt to define something by what it does,

rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients), the Court has held that there is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart,* 439 F.2d 210, 169 USPQ 226 (CCPA 1971); MPEP §2173.05(g). It was held that the limitation used to define a radical on a chemical compound as "incapable of forming a dye with said oxidizing developing agent," although functional, was perfectly acceptable because it set definite boundaries on the patent protection sought. *In re Barr,* 444 F.2d 588, 170 USPQ 33 (CCPA 1971). Similarly, Applicants have provided the functional limitation that the polypeptides of the invention function as non-desensitizing AMPA-receptors, or as non-desensitizing subunits thereof. Furthermore, Applicants have amended the claims 1-4, 9, 10, 19, 22, 24, 34 and 35 to include the structural limitation that the amino acid sequence has at least 70% identity to SEQ ID NO: 7. Applicants respectfully submit that one skilled in the art would therefore understand how to make and use the polypeptides of the invention, and any claimed variants thereof, thereby rendering the claims as not overly-broad.

The Examiner further rejects claims 1-17, 21-23, 34-35 and 37 under 35 U.S.C. §112, first paragraph, alleging that the specification and claims do not place any limit on the number of amino acid substitutions, deletions, insertions and/or additions that may be made to the encoded AMPA Receptor variants. Applicants respectfully submit that the claims are not drawn to a complement of a nucleic acid which hybridizes to a nucleic acid encoding SEQ ID NO: 7, as indicated by the Examiner on page 7 of the Office Action. Rather, as amended, claim 2 discloses a nucleic acid molecule having at least 70% identity to SEQ ID NO: 7 and having at least 12 nucleotides which codes for non-desensitizing glutamate receptors of the AMPA-type hybridizing to the complementary strand of SEQ ID NO: 7. Accordingly, Applicants respectfully submit that one skilled in the art would therefore understand how to make and use the polypeptides of the invention, and any claimed variants thereof, thereby rendering the claims as not overly-broad.

The Examiner further rejects claims 10-16 under 35 U.S.C. §112, first paragraph, alleging that the specification, while being enabling for a host cell in culture comprising a polynucleotide with the sequence as set forth in SEQ ID NO: 17, does not reasonably provide

enablement for *in vivo* transfection. Applicants submit that the technique of transformation is known in the art. However, to further prosecution, Applicants have amended claim 10 to indicate that the host is isolated, as suggested by the Examiner.

Therefore, for all the above reasons Applicant asserts that one skilled in the art would understand that the inventor was in possession of the claimed invention at the time of filing. Withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. § 112, Second Paragraph

The rejection of claim 4 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is respectfully traversed. Specifically, the Examiner alleges that claim 4 is unclear as to whether the term "derived from" imposes a required limitation on the claim. Applicant has amended claim 4 to indicate that the (poly)peptide is derived from a human. Accordingly, Applicants submit that claim 4 is now definite, and withdrawal of the rejection is respectfully requested.

The rejection of claims 34 and 35 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is respectfully traversed. Specifically, the Examiner alleges that claims 34 and 35 do not set forth any steps involved in the method/process that Applicants intend to cover. Applicants have amended claims 34 and 35 to recite the steps involved in the process. Accordingly, Applicants submit that claims 34 and 35 are now definite, and withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. § 102

The rejection of claim 2 under 35 U.S.C. §102(b), as allegedly being anticipated by the Stratagene catalogue of 1991, is respectfully traversed. Specifically, the Examiner alleges that the Stratagene catalogue discloses the use of random 9-mers capable of hybridizing to all gene sequences. Applicants respectfully submit that the invention nucleic acid molecule, as defined by amended claim 2, distinguishes over the disclosure of the Stratagene catalogue by requiring a nucleic acid molecule having at least 12 nucleotides which codes for non-desensitizing glutamate receptors of the AMPA-type hybridizing to the complementary strand of a nucleic acid molecule of (a) or (b).

Anticipation under 35 U.S.C. § 102(b) requires that the reference recite each and every element of the claims in a single document. Since the Stratagen catalogue fails to disclose each and every element of the claimed invention, as defined by amended claim 2, Applicants respectfully submit that the Examiner has failed to establish anticipation under 35 U.S.C. § 102 (b) over Stratagene (1991). Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

In summary, for the reasons set forth herein, Applicants maintain that claims 1-35 and 37 clearly and patentably define the invention and respectfully request that the Examiner withdraw all rejections and pass the application to allowance. If the Examiner would like to discuss any of the issues raised in the Office Action, the Examiner is encouraged to call the undersigned so that a prompt disposition of this application can be achieved.

Enclosed is Check No. 577610 in the amount of $60.00 for the one (1) month Extension of Time fee. The Commissioner is hereby authorized to charge for any additional required fees, or credit any overpayments to Deposit Account No. 07-1896.

Respectfully submitted,

Date: May 9, 2005

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